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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/681,617

05/09/2001

Nick Andrew Van Stralen

RD-27130

3017

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7590

03/10/2005

GENERAL ELECTRIC COMPANY  
GLOBAL RESEARCH  
PATENT DOCKET RM. BLDG. K1-4A59  
NISKAYUNA, NY 12309

EXAMINER

FERRIS, DERRICK W

ART UNIT

PAPER NUMBER

2663

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/681,617

**Applicant(s)**

VAN STRALEN ET AL.

**Examiner**

Derrick W. Ferris

**Art Unit**

2663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/9/2001.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 6-8, 12-19, and 21-24** are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,622,177 A to *Breimesser et al.* (“*Breimesser*”).

As to **claim 6**, an ultrasonic probe is taught as probe 2, see e.g., figure 1. An ultrasonic array having a plurality of ultrasonic array outputs is shown as 3. A time-domain multiplexer having an input connected to each of the plurality of ultrasonic array outputs and having a multiplexer output wherein the time-domain multiplexer continually cycles through each of the plurality of ultrasonic array outputs at a predetermined frequency connecting each of the plurality of ultrasonic array outputs to the multiplexer output for a predetermined amount of time is Mux 22. In particular, see e.g., column 3, lines 1-14 with respect to each of the array outputs connected to the multiplexer and see e.g., column 3, lines 15-30 and column 4, line 40 – column 5, line 40 with respect to servicing the multiplexer for a predetermined amount of time (i.e., time-domain multiplexing). In addition, in providing a reset function, the circuit is enabled to cycle continuously. An ultrasonic data processing unit is taught e.g., as base unit 4. A de-multiplexer connected to the multiplexer output is further taught as demux 42. In particular, the demux 42 has a plurality of de-multiplexer outputs (G1-Gk) wherein the

de-multiplexer continually cycles through each of the plurality of de-multiplexer outputs at the predetermined frequency connecting each of the plurality of demultiplexer outputs to the multiplexer output for the predetermined amount of time, see e.g., column 4, line 40 – column 5, line 40. A timing reference connected to the time-domain multiplexer and the demultiplexer for providing a single time reference to determine at least the predetermined frequency is taught as the M3 signals and in particular CLK, see e.g., figure 2.

As to **claim 7**, see e.g., figure 1.

As to **claim 8**, see e.g., figure 1 where it is inherent since the number of lines between the probe and base unit is minimized, see e.g., column 2, lines 54-55.

As to **claim 12**, see e.g., figure 1 where the cable bundles are L.

As to **claim 13**, see e.g., figure 1 where the plurality of multiplexers are taught based on the input sequences to multiplexer 22. A plurality of demultiplexers is further taught based on the number of inputs and outputs. Although the outputs of the demultiplexers are not shown in the figure, one skilled in the art would recognize that the signals are de-combined in the same way (i.e., the reverse process) thus teaching the outputs for the demultiplexers.

As to **claim 14**, see the combination of claims 6, 7, and 8.

As to **claim 15**, see e.g., column 4, line 40 – column 5, line 40 with respect to selecting a predetermined time period.

As to **claim 16**, see similar rejection to claim 6 with respect to CLK.

As to **claim 17**, see similar rejection to claim 6.

Art Unit: 2663

As to **claim 18**, see similar rejection to claim 7.

As to **claim 19**, see similar rejection to claim 8.

As to **claim 21**, see e.g., column 4, line 40 – column 5, line 40 with respect to selecting a predetermined time period.

As to **claim 22**, see similar rejection to claim 6. In particular, the system is designed with respect to imaging, see e.g., column 2, lines 29-35.

As to **claim 23**, see e.g., column 4, line 40 – column 5, line 40 with respect to selecting a predetermined time period.

As to **claim 24**, see similar rejection to claim 6 with respect to CLK.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-5, 9-11 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,622,177 A to *Breimesser et al.* ("*Breimesser*") in view of U.S. Patent No. 5,566,133 to *Engeler et al.* ("*Engeler*").

As such to **claim 1**, *Breimesser* discloses similar limitations as mentioned in the rejection for claim 6.

*Breimesser* is silent or deficient to the further limitation of the structure of the base unit and in particular the further limitations of a time gain control amplifier connected to each of the plurality of outputs which amplifies each respective signal in

each of the plurality of de-multiplexer outputs, and an analog-to-digital converter connected to the time again control amplifier.

*Engeler* teaches the further recited limitation above at e.g., figure 2 with respect to TGC amp 62 and A/D converter 64.

The proposed modification of the above-applied reference(s) necessary to arrive at the claimed subject matter would be to modify *Breimesser* by clarifying that elements in the base unit structure are well known in the art.

As such, examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to include the above limitation. In particular, the motivation for modifying the reference or to combine the reference teachings would be to reduce the dynamic range requirements of the ultrasound signal. In particular, *Engeler* cures the above-cited deficiency by providing a motivation found at e.g., column 3, lines 33-40. Second, there would be a reasonable expectation of success since both references teach an ultrasonic imaging system. Thus the references either in singular or in combination teach the above claim limitation(s).

As to **claim 2**, see figure 2 where the binary optical module 60 is the image processing electronics.

As to **claim 3**, see similar rejection to claim 7.

As to **claim 4**, see similar rejection to claim 13.

As to **claim 5**, see e.g., column 4, line 40 – column 5, line 40 with respect to selecting a predetermined time period.

As to **claim 9**, see similar rejection to claim 1.

Art Unit: 2663

As to **claim 10**, see similar rejection to claim 1.

As to **claim 11**, see similar rejection to claim 2.

As to **claim 20**, see similar rejection to claim 1 with respect to the TGC amp.

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US006506160B1 teaches reducing the number of cables with respect to frequency multiplexing, see e.g., Abstract.
- US006142946A teaches reducing the number of cables with respect to multiplexing in general see e.g., column 2, lines 59-67

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (571) 272-3123.

The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571)272-3139. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Application/Control Number: 09/681,617

Page 7

Art Unit: 2663

  
DWF

Derrick W. Ferris  
Examiner  
Art Unit 2663

  
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2/1-05